

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1       Claim 1 (currently amended): A method of joining workpieces  
2       comprising:

3           a) creating a first surface diffusion zone containing  
4       therein a first polymerizable material, wherein said first  
5       surface diffusion zone is adjacent to a first surface of a  
6       first workpiece and is within said first workpiece; and,

7           if present, removing any non-absorbed excess of said  
8       first polymerizable material from said first surface; and,

9           b) creating a second surface diffusion zone containing  
10      therein a second polymerizable material, wherein said second  
11      surface diffusion zone is adjacent to a second surface of a  
12      second workpiece and is within said second workpiece; and,

13           if present, removing any non-absorbed excess of said  
14      second polymerizable material from said second surface, and  
15      wherein said first polymerizable material and said second  
16      polymerizable material are capable of bonding with each  
17      other; and,

18           c) bringing said first surface and said second surface  
19      into intimate contact at a bonding surface; and,

20           d) causing said first polymerizable material and said  
21      second polymerizable material to react and join across said  
22      bonding surface.

1       Claim 2 (previously presented): A method of joining as in  
2       claim 1 wherein at least one of said first surface or said  
3       second surface has at least one microfeature therein.

Claim 3 (canceled).

1       Claim 4 (previously presented): A method of joining as in  
2       claim 1 wherein at least one of said first workpiece or said  
3       second workpiece is selected from the group consisting of  
4       polyimides, polyetherketones, polyetherimides,  
5       polyphenylenes, and polyether-ether-ketones.

1       Claim 5 (previously presented): A method of joining as in  
2       claim 4 wherein said first workpiece and said second  
3       workpiece are polyphenylenes and said first polymerizable  
4       material and second polymerizable material are mixtures of  
5       styrene and divinylbenzene.

1       Claim 6 (previously presented): A method of joining as in  
2       claim 5 wherein both of said mixtures have a ratio of  
3       approximately 9:1 by volume of styrene to divinylbenzene.

1       Claim 7 (currently amended): A method of joining workpieces  
2       comprising:

- 3           a) creating a first surface diffusion zone containing  
4           therein a polymerizable material, wherein said first surface  
5           diffusion zone is adjacent to a first joining surface of a  
6           first workpiece and is within said workpiece and, ~~if~~  
7           present, removing any non-absorbed excess of said  
8           polymerizable material from said first joining surface; and,  
9           b) providing a second workpiece having a second joining  
10          surface; and,

11           c) bringing said first joining surface and said second  
12       joining surface into intimate contact at a bonding surface;  
13       and,

14           d) causing said polymerizable material to react and  
15       join across said bonding surface.

1       Claim 8 (previously presented): A method of joining as in  
2       claim 7 wherein at least one of said first joining surface  
3       or said second joining surface has at least one microfeature  
4       therein.

Claim 9 (canceled).

1       Claim 10 (previously presented): A method of joining as in  
2       claim 7 wherein at least one of said first workpiece or said  
3       second workpiece is selected from the group consisting of  
4       polyimides, polyetherketones, polyetherimides,  
5       polyphenylenes, and polyether-ether-ketones.

1       Claim 11 (previously presented): A method of joining as in  
2       claim 10 wherein said first workpiece is a polyphenylene,  
3       said second workpiece is a polyetherimide and said  
4       polymerizable material is styrene.

Claims 12-21 (canceled).

1       Claim 22 (currently amended): A method of fabricating a  
2       microfluidic device comprising:  
3           creating a first surface diffusion zone containing  
4       therein a first polymerizable material, wherein said first  
5       surface diffusion zone is adjacent to a first surface of a  
6       first workpiece and is within said first workpiece; and,

7       ~~if present,~~ removing any non-absorbed excess of said  
8 first polymerizable material from said first surface; and,  
9       creating a second surface diffusion zone containing  
10 therein a second polymerizable material, wherein said second  
11 surface diffusion zone is adjacent to a second surface of a  
12 second workpiece and is within said second workpiece; and,  
13       ~~if present,~~ removing any non-absorbed excess of said  
14 second polymerizable material from said second surface; and,  
15       wherein said first polymerizable material and said  
16 second polymerizable material are capable of bonding with  
17 each other; and,  
18       wherein at least one of said first surface and said  
19 second surface has one or more microfluidic features  
20 therein; and,  
21       bringing said first surface and said second surface  
22 into intimate contact at a bonding surface so as to form a  
23 microfluidic device; and,  
24       causing said first polymerizable material and said  
25 second polymerizable material to react and join across said  
26 bonding surface, creating thereby a microfluidic device.

1       Claim 23 (currently amended): A method of fabricating a  
2 microfluidic device comprising:

3       creating a first surface diffusion zone containing  
4 therein a first polymerizable material, wherein said first  
5 surface diffusion zone is adjacent to a first joining  
6 surface of a first workpiece and is within said first  
7 workpiece; and,  
8       ~~if present,~~ removing any non-absorbed excess of said  
9 first polymerizable material from said first joining  
10 surface; and,

11               providing a second workpiece having a second joining  
12               surface; and,

13               wherein at least one of said first joining surface and  
14               said second joining surface has one or more microfluidic  
15               features therein; and,

16               bringing said first joining surface and said joining  
17               second surface into intimate contact at a bonding surface so  
18               as to form a microfluidic device; and,

19               causing said polymerizable material to react and join  
20               across said bonding surface, creating thereby a microfluidic  
21               device.

1               Claim 24 (new): A method of joining porous polymer  
2               workpieces comprising:

3               a) applying a first polymerizable material to a first  
4               surface of a first porous polymer workpiece; and,

5               (i) causing said first polymerizable material to  
6               penetrate said first surface of said first porous  
7               polymer workpiece, creating therein a first surface  
8               diffusion zone adjacent to said first surface; and,

9               (ii) drying said first surface thereby removing  
10               any non-absorbed excess of said first polymerizable  
11               material; and,

12               b) applying a second polymerizable material to a  
13               second surface of a second porous polymer workpiece;  
14               and,

15               (i) causing said second polymerizable material to  
16               penetrate said second surface of said second porous  
17               polymer workpiece, creating therein a second surface  
18               diffusion zone adjacent to said second surface; and,

19                         (ii) drying said second surface, thereby removing  
20                         any non-absorbed excess of said second polymerizable  
21                         material; and,  
22                         c) bringing said first surface and said first surface  
23                         diffusion zone adjacent thereto into intimate contact  
24                         with said second surface and said second surface  
25                         diffusion zone adjacent thereto creating a bonding  
26                         interface; and,  
27                         d) applying heat, pressure, radiation, or combinations  
28                         thereof to said bonding interface, thereby causing said  
29                         first polymerizable material and said second  
30                         polymerizable material to react and join together  
31                         across said bonding interface, thereby bonding said  
32                         first porous polymer workpiece to said second porous  
33                         polymer workpiece.